

CLAIMS

1. A fixing apparatus comprising:
  - a magnetic flux generation section that  
5 generates magnetic flux;
  - a heat-producing element made of a nonmagnetic electrical conductor, that allows passage of the magnetic flux and is induction-heated;
  - at least one magnetism masking element that  
10 masks the magnetic flux; and
  - a magnetic flux adjustment section that switches between masking and clearing of magnetic flux with respect to a paper non-passage area of said heat-producing element,
- 15 wherein said magnetism masking element is located on the opposite side of said heat-producing element from said magnetic flux generation section.
2. The fixing apparatus according to claim 1,  
20 comprising an opposed core located on the opposite side of said heat-producing element from said magnetic flux generation section,
- wherein said magnetism masking element moves relative to said magnetic flux generation section  
25 in a direction of movement of said heat-producing element, and is displaced between a magnetic path blocking position at which a magnetic path

corresponding to a paper non-passage area of said heat-producing element between said magnetic flux generation section and the opposed core is blocked, and a magnetic path clearing position at which the  
5 magnetic path is cleared.

3. The fixing apparatus according to claim 1, wherein:

said heat-producing element is formed in a  
10 circular shape; and

said magnetism masking element is located inside said heat-producing element; and

said magnetic flux generation section is located outside said heat-producing element.

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4. The fixing apparatus according to claim 1, wherein:

said magnetic flux generation section comprises:

20 an exciting coil that is wound and placed;  
and

a center core located in a center of windings of the exciting coil; and

a width of said magnetism masking element in  
25 a direction of movement relative to said magnetic flux generation section is greater than a width of the center core in the same direction.

5. The fixing apparatus according to claim 4,  
wherein the width of said magnetism masking element  
in a direction of movement relative to the magnetic  
5 flux generation section is narrower than a winding  
width of a winding section of the exciting coil in  
the same direction.

6. The fixing apparatus according to claim 5,  
10 wherein at least one magnetic path clearing position  
of said magnetism masking element is a position at  
which said magnetism masking element is opposite the  
winding section of the exciting coil.

15 7. The fixing apparatus according to claim 4,  
wherein a magnetic path blocking position at which  
a magnetic path of a paper non-passage area of said  
heat-producing element is blocked by said magnetism  
masking element is a position at which said  
20 magnetism masking element is opposite the center of  
the windings of the exciting coil.

8. The fixing apparatus according to claim 1,  
wherein:  
25 said magnetic flux generation section  
comprises an exciting coil that is wound and placed;  
and

a width of said magnetism masking element in a direction of movement relative to said magnetic flux generation section is greater than a width of a center of windings of the exciting coil in the same  
5 direction.

9. The fixing apparatus according to claim 8, wherein the width of said magnetism masking element in a direction of movement relative to said magnetic  
10 flux generation section is narrower than a winding width of a winding section of the exciting coil in the same direction.

10. The fixing apparatus according to claim 9,  
15 wherein at least one magnetic path clearing position of said magnetism masking element is a position at which said magnetism masking element is opposite the winding section of the exciting coil.

20 11. The fixing apparatus according to claim 8, wherein a magnetic path blocking position at which a magnetic path of a paper non-passage area of said heat-producing element is blocked by said magnetism  
masking element is a position at which said  
25 magnetism masking element is opposite the center of the windings of the exciting coil.

12. The fixing apparatus according to claim 1,  
comprising a plurality of said magnetism masking  
elements having lengths corresponding to each of a  
plurality of paper non-passage areas of mutually  
5 different widths of said heat-producing element.

13. The fixing apparatus according to claim 12,  
wherein:

the plurality of said magnetism masking  
10 element are provided on a rotating element that  
rotates freely relative to said magnetic flux  
generation section; and

an angle forming a normal line passing through  
centers of two mutually adjacent magnetism masking  
15 elements is set to an angle of either 30  
degrees< $\theta 3$ <60 degrees or 120 degrees< $\theta 4$ <180  
degrees.

14. The fixing apparatus according to claim 1,  
20 further comprising an opposed core located opposite  
said magnetic flux generation section,

wherein said magnetism masking element is  
provided on the opposed core that is rotatable  
relative to said magnetic flux generation section.

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15. The fixing apparatus according to claim 2,  
wherein said magnetism masking element is formed by

a cutaway part provided in the opposed core.

16. The fixing apparatus according to claim 2,  
wherein said magnetism masking element is formed by  
5 a recess provided in the opposed core.

17. The fixing apparatus according to claim 15,  
wherein an electrical conductor is embedded in the  
cutaway part.

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18. The fixing apparatus according to claim 17,  
wherein the electrical conductor forms a same plane  
with a surface of the opposed core.

15 19. The fixing apparatus according to claim 13,  
wherein an electrical conductor is embedded in the  
recess.

20. The fixing apparatus according to claim 19,  
20 wherein the electrical conductor is formed flush  
with a surface of the opposed core.

21. The fixing apparatus according to claim 1,  
wherein the plurality of said magnetism masking  
25 elements have lengths corresponding to each of A3  
size width, A4 size width, and B4 size width paper  
non-passage areas of said heat-producing element.

22. The fixing apparatus according to claim 1,  
comprising a paper passage area magnetism masking  
element having a length corresponding to a paper  
5 passage area width smaller than a width of a maximum  
paper passage area of said heat-producing element,  
wherein the paper passage area magnetism  
masking element is placed in a position  
corresponding to a paper passage area of said  
10 heat-producing element.

23. The fixing apparatus according to claim 1,  
wherein:  
said heat-producing element is configured with  
15 an endless belt; and  
a belt supporting member on which the endless  
belt is suspended is configured with a member that  
allows passage of magnetic flux.

20 24. The fixing apparatus according to claim 23,  
wherein the belt supporting member is made of a  
metallic material with a thickness in a range of 0.04  
mm to 0.2 mm in a vertical direction with respect  
to a peripheral surface of the endless belt.

25 25. The fixing apparatus according to claim 23,  
wherein the belt supporting member has a specific

resistance of 50  $\mu\Omega\text{cm}$  or more.

26. The fixing apparatus according to claim 23,  
wherein the belt supporting member is made of a  
5 nonmagnetic stainless material.

27. The fixing apparatus according to claim 23,  
wherein the belt supporting member comprises a  
rotatable supporting roller in which a sheet is  
10 formed into a cylindrical shape and a joint is  
welded.

28. The fixing apparatus according to claim 23,  
wherein the belt supporting member comprises a  
15 rotatable supporting roller in which rib-shaped  
reinforcing grooves are formed in a direction of a  
generating line of a cylinder.

29. The fixing apparatus according to claim 23,  
20 wherein a circumference of the endless belt is a  
non-integral multiple of an outer circumference of  
the supporting roller.

30. The fixing apparatus according to claim 23,  
25 wherein the belt supporting member comprises a  
rotatable supporting roller in which knurl-shaped  
projections and depressions are formed on an outer



surface of a cylinder.

31. The fixing apparatus according to claim 30,  
wherein:

5       the projections and depressions are formed  
with a predetermined pitch in a circumferential  
direction of the supporting roller; and

          a circumference of the endless belt is a  
non-integral multiple of a pitch of the projections  
10   and depressions.

32. The fixing apparatus according to claim 23,  
wherein the belt supporting member is formed with  
a supporting roller in which a plurality of  
15   channel-shaped sheets are combined into a  
cylindrical shape.

33. The fixing apparatus according to claim 23,  
wherein the belt supporting member is formed with  
20   a guide member in which a sheet is formed into an  
arc shape.

34. An image forming apparatus comprising the  
fixing apparatus according to claim 1.

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35. The fixing apparatus according to claim 1,  
wherein said heat-producing element is made of thin

copper material.

36. The fixing apparatus according to claim 1,  
wherein said magnetism masking element is made of  
5 an electrical conductor.

37. The fixing apparatus according to claim 1,  
wherein said magnetism masking element is made of  
copper material.

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38. The fixing apparatus according to claim 1,  
wherein said magnetism masking element is made of  
aluminum material.